

Call for Proposals -- DRAFT 2022 Planetary Mission Senior Review June 8, 2021

*This is a Draft Call, in preparation for the Final Call to be released July 9, 2021.
Comments to NASA on this Draft Call are due June 25, 2021.*

1. Overview

The Planetary Science Division (PSD) conducts periodic review of missions approaching the end of their authorized funding (End-of-Mission, EOM) to assess the value and opportunity of funding additional operations. The normal cadence for mission reviews is every three years.

PSD will hold its next Planetary Mission Senior Review (PMSR) in early 2022 to evaluate proposals requesting extended operations for FY23 through FY25. Missions that will reach the end of their current Prime Mission or Extended Mission (EM) operations by the end of FY22 will be reviewed at this PMSR. The OREx mission will also be reviewed at this PMSR, ahead of its nominal schedule, in order to evaluate opportunities for spacecraft operations after the Sample Return Capsule has been released from the spacecraft.

The following missions will be reviewed at the 2022 PMSR:

Mission	Current EOM
MAVEN	September 2022
Mars Odyssey (ODY)	September 2022
Mars Science Laboratory (MSL)	September 2022
Mars Reconnaissance Orbiter (MRO)	September 2022
Lunar Reconnaissance Orbiter (LRO)	September 2022
New Horizons (NH)	September 2022
OSIRIS-REx (OREx)	September 2023

2. Proposal Content

Proposals should focus on the contents of the proposed EM. Each proposal is limited to 40 pages, on 8.5" x 11" paper, with 1" margins. Multiple-page foldouts are counted as multiple pages. Font for the main text and captions must be 12-point or larger. For text within figures and tables, the font

size must be legible without magnification. Expository text necessary for the proposal may not be located solely in figures or tables, or their captions.

- i. Title Page (not in page limit)
- ii. Table of Contents (not in page limit)
 1. Executive Summary
 2. Current Mission Status
 3. Historical Accomplishments (c.f. Table 1, Appendix A)
 4. Proposed Mission Science Objectives
 5. Science Traceability Matrix (c.f. Table 2, Appendix A)
 - The STM should link the goals and questions in the Decadal Survey to the goals, science objectives, and measurements to be taking during the EM.
 6. Proposed Mission Programmatic Objectives (optional)
 - This may include activities such as data relay for other NASA or international missions; science which advances the goals of NASA divisions or directorates beyond PSD and SMD; international cooperation; or other non-science activities.
 7. Technical Plan to Meet Objectives
 8. Management Plan
 - Project organization and roles and capabilities of key personnel
 - Risk analysis
 - Include risks due to operations and spacecraft health, and the implications on operations and science
 9. Data Archiving
 - Summary of past archiving and performance with the PDS
 - Summary of data usage by the broader community, based on reported PDS data usage statistics, the number of publications citing mission data or linking to Digital Object Identifiers (DOIs) of mission data, or other usage statistics.
 10. Professional Development Plan
 11. Budget and Descope
 - Budget should include a table by WBS Level II per FY, and should include both the current mission phase and the EM.

An appendix (no page limit) should be included, consisting of:

- A1. Acronym List
- A2. References
- A3. Team Publications
 - List of relevant journal publications where the primary author is or was on the team, with summary table listing total publication counts per year.
- A4. External Publications
 - List of relevant journal publications where the primary author is not or was not on the team, with summary table listing total publication counts per year
- A5. Science Team

- Name, role, and affiliation of science team members to be funded during EM, with very brief descriptions of their science focus during the EM (e.g., ‘Martian atmospheric chemistry’). Individuals not yet identified may be listed as ‘TBD.’ Proposal should identify any members serving as part of a separately funded NASA Participating Scientist Program (PSP).
- A6. Project Data Management Plan (PDMP)

3. Proposal Content Notes

Professional Development Plan (PDP)

NASA has a strong interest in developing the leadership and management skills of scientists who aspire to serve in leadership roles on future missions. Given the long cadence of planetary missions, it is important that developmental activities for future leaders be incorporated into the planning and decision processes for extended missions. NASA encourages proposals to include plans for one or more aspiring mission Principal Investigators and/or Project Scientists to prepare them to lead future missions. The PDP should identify roles and mentors for these individuals, and describe a plan to build their skills and experience.

Budget Guidelines and Descopes

Each mission will submit a proposal that assumes a Guideline Budget. This budget will be developed cooperatively between the mission and the mission’s assigned Program Executive (PE) and Program Scientist (PS).

Missions are also encouraged to identify possible descopes to their proposed EM plan. These descopes should be set to allow meaningful cost savings to NASA by substantively reducing the scope of the science investigation, and/or of mission operations. These descopes may increase the risk of the mission. Depending on the nature of the descopes, the proposal may present these descopes as independent options, or cumulatively.

For missions that expect to terminate during the EM timeframe, missions should assume six months of funding for science evaluation and closeout. The budget to support this closeout should be included and described in the proposal.

Project Data Management Plan (PDMP)

The PDMP should follow the same format as each mission’s current PDMP. The PDMP should be updated to reflect each mission’s current status and practices, and describe data management through proposed mission closeout. All proposals must:

1. Archive all science data to NASA’s Planetary Data System (PDS).

- If the mission is not currently delivering data to the PDS in PDS4 format, the mission must include a plan on how it will start delivering data in PDS4 format for the next completed phases of the mission. This plan should be coordinated with the lead PDS Node for the mission and should include details on any mission budget requirements to start upcoming data deliveries in PDS4. While the proposed plan for new data deliveries in PDS4 need not address conversion of previous PDS3 data deliveries to PDS4, plans that facilitate converting previously delivered data from PDS3 to PDS4 are encouraged. If costs to deliver mission data in PDS4 are to be supported outside the mission (e.g. by the PDS Node), the mission proposal should provide such a statement supported in a letter from the PDS.
- 2. Include a plan to place new mission science analysis code and algorithms developed for the proposed investigations into an open repository.
- 3. Include a letter from the PDS node(s) indicating their concurrence to the proposed PDMP.

These requirements are based on the *Strategy for Data Management and Computing for Groundbreaking Science 2019-2024*, developed by SMD's *Strategic Data Management Working Group (SDMWG)*.

Proposal Content - Exclusions

Communications plans are not being evaluated as part of the PMSR. Missions that are selected for extensions may be subjected to a separate SMD communications review at a later date, as described in NASA's *Policy and Requirements for SMD Communications for Flight Missions (SPD-26B)*. Although a communications plan is not being solicited for the PMSR, the proposed EM budget should include a communications budget based on activities described in each mission's existing communications plan.

4. Assumptions about spacecraft capabilities

Proposals must be consistent with the expected operational capability of the spacecraft. Any significant impact due to expected spacecraft or instrument degradation or possible changes in operational limitations (e.g., consumables, data relay) should be clearly described.

5. Proposal Submission

Proposals will be submitted through NASA's NSPIRES proposal system. Proposals will be submitted as a single PDF file containing all of the required components. No Notice-of-Intent (NOI) or Step-1 proposal is required. A redacted budget is not required.

6. Review Panel

NASA will assemble a review panel for each mission consisting of Subject Matter Experts (SMEs). The panel membership will consist of leading authorities with relevant expertise in science, engineering, mission operations and data archiving drawn from government, academia, and

industry. Each mission will be reviewed by a separate panel led by a Panel Chair; individual panelists may serve on one or more panels. Two Review Chairs -- one for Mars, and one for OREx, LRO, and NH -- will serve as panelists on all of their respective panels.

Proposals will be evaluated on criteria related to scientific merit and technical capability by the review panels. In advance of the review, the panels will give the mission teams written questions based on the proposals. The mission teams will answer these questions at the oral presentation. The presentation may be held virtually.

Each mission may provide NASA with a list of up to five suggested reviewers, and a list of up to three reviewers that should not be used.

Each mission must provide NASA with a list of all team members, including those currently funded and those expected to be funded in the EM, before submission of the proposal (see Schedule).

7. Oral Presentation

Mission teams will make an oral presentation to the review panel. The presentation for each mission will be structured as follows:

- 15 minutes for EM proposal overview
- 5 minutes for updates since submission of the proposal
- 60 minutes to respond to panel's written questions
- 30 minutes for panel discussion (mission not present)
- 30 minutes for additional oral Q&A as needed

The review is not intended to provide a full oral presentation of the proposal contents. Presenters should assume the panel is familiar with the proposal, allowing the team and panel to focus on questions.

Each mission must supply NASA with a complete list of up to five presenters in advance of the presentation (see Schedule). No other team members may observe the presentation.

The role of the PE and PS at the panel will be limited to being present during panel discussions to answer programmatic questions posed by panelists.

8. Evaluation Criteria

Proposals will be evaluated based on factors related to both the proposed EM, and the performance of the mission and team in the previous cycle. These criteria are classified as Primary and Secondary; the Primary criteria each carry a greater weight in the overall evaluation than the Secondary criteria. The evaluation criteria to be used are as follows.

Primary Criteria

- Scientific merit of the proposed investigations to be undertaken during the EM.
- Responsiveness of the proposal to goals described in the Decadal Survey(s) in effect at the time of mission selection through present; i.e., *New Frontiers in the Solar System: An Integrated Exploration Strategy* (2003) and/or *Vision and Voyages for Planetary Science in the Decade 2013-2022* (2011).
- Capability of the spacecraft to achieve proposed science.
- Scientific productivity of the mission team in the previous cycle.
- Performance in archiving data to the PDS in the previous cycle.

Secondary Criteria

- Extent to which the science community beyond the mission science team utilizes data and conducts research.
- Scientific merit of observations to be taken and archived to the PDS, for future use by the scientific community.
- Science value.
 - The PMSR will not perform a detailed cost analysis of each proposal. However, the panels may assess in broad terms the science return of the mission relative to its overall cost. The panels may also assess the relative science return of descope options presented at different budget levels.
- Demonstrated capabilities, experience, and expertise of key team members, including PI, Deputy PI, Project Manager, and Science Team Leads.
- Effectiveness of the PDP in training future leaders.
- Merit of programmatic objectives.
 - The PMSR will evaluate separately the objectives of relevance to PSD, and those of relevance to other Divisions or Directorates at NASA, and may assign different weights to each.
- Thoroughness and appropriateness of the PDMP.
 - The PMSR will evaluate data and software usability, discoverability, and accessibility, in addition to adherence to PDS requirements.

9. Review Findings

A *Final Report* of all reviewed missions will be written by the Review Chairs. The *Final Report* and individual mission evaluations will be delivered to the NASA PSD Director. The PSD Director will develop a response to the findings and notify in order:

- SMD Associate Administrator
- Individual missions
- Planetary Advisory Committee (PAC) chair
- The community, via a white paper on *NASA Response to the 2022 Planetary Mission Senior Review*.

For those missions that are selected for mission extensions, a plan and budget will be approved for the extended mission period, with preliminary direction for future years. The missions will be provided with a Letter of Direction containing decisions and directions. The mission's SME evaluation will be attached.

The *Final Report* will be posted publicly. The individual SME evaluations of each mission may be posted at the discretion of the Division Director. The final report and SME evaluation will be given to each mission in advance of their public posting.

If any missions are proposed for termination, a communication plan will be established with Agency leadership, the Office of Communications, the Office of Legislative Affairs, and other stakeholders.

All public documents, including the *Call for Proposals*, the *Final Report*, and the *NASA Response*, will be posted on the Lunar and Planetary Institute (LPI) website at <https://www.lpi.usra.edu/NASA-academies-resources/>.

10. Schedule

The following schedule is planned for the 2022 PMSR.

Draft Call for Proposals Issued to Missions	8-Jun-2021
Draft Call Comment Due	25-Jun-2021
Final Call Released	9-Jul-2021
Guideline Budgets to Missions	9-Jul-2021
List of Mission Team Members, Presenters and Suggested and Non-suggested Reviewers Due to NASA (*)	1-Sep-2021
Proposals Due	14-Jan-2022
Questions to Missions (Panel Week 1)	4-Feb-2022
Questions to Missions (Panel Week 2)	11-Feb-2022
Panel Week 1: MAVEN / ODY / MSL / MRO	Week of 21-Feb-2022
Panel Week 2: NH / OREx / LRO	Week of 28-Feb-2022
Panel Findings due to NASA	1-Apr-2022
NASA Response and Direction to Missions	15-Apr-2022

(*) List of presenters may be modified later with NASA concurrence.

11. Contact Information

For questions related to budget or planning, missions should contact their designated PS or PE at NASA HQ.

For questions related to the PMSR process, and **for comments on this Draft Call, please contact:**

PMSR Lead: Henry.Throop@nasa.gov, (303) 444-2539
PMSR Deputy Lead: Lindsay.Hays@nasa.gov

12. References

1. NASA Strategic Data Management Working Group. *Strategy for Data Management and Computing for Groundbreaking Science 2019-2024*. December 2019.
2. National Academy of Sciences. *New Frontiers in the Solar System: An Integrated Exploration Strategy*. 2003.
3. National Academy of Sciences. *Vision and Voyages for Planetary Science in the Decade 2013-2022*. March 2011.
4. NASA SMD. *Policy and Requirements for SMD Communications for Flight Missions*. SMD SPD-26B. May 2020.

Appendix A. Templates

Table 1. Template for Mission Accomplishments and EM Science Objectives

#	Objective	Status	Comments
1		Completed; Not Completed; Expected to be Completed; New	
2			
3			

This table should include Level 1 science objectives from the current mission cycle, as well as those from the proposed EM.

Table 2. Template for Science Traceability Matrix

#	Decadal Survey Goal / Objective	Decadal Survey Question	EM Science Goal	EM Science Objective	Measurements	Instruments
1						
2						
3						